EFFECTS OF THREE PRESENTATION FORMATS OF RECORDED LISTENING MATERIAL ON COMPREHENSION...

A. Heinze, 1976

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EFFECTS OF THREE PRESENTATION FORMATS OF RECORDED LISTENING MATERIAL ON COMPREHENSION AND RETENTION OF VISUALLY HANDICAPPED STUDENTS

by

Antoinette Heinze

A Dissertation
Submitted to the Graduate School
of the University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

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TABLE OF CONTENTS

LIST OF TABLES iv

LIST OF ILLUSTRATIONS v

Chapter

1. INTRODUCTION 1

Rationale
Review of the Literature
Statement of the Problem
Definition of Terms

II. PROCEDURES 19

Description of Subjects
Description of Materials and Instruments
Description of Procedures
Statistical Treatment of Data
Limitations of the Study

III. RESULTS 33

Introduction
Descriptive Data
Assumptions Related to Analysis of Covariance
Data Related to Variables Age, Sex, Reading Medium, and IQ
Summary

IV. DISCUSSION 52

Summary of the Study
Discussion of the Results
Summary of the Conclusions
Recommendations

APPENDIX A. SAMPLE ANSWER FORM 62

APPENDIX B. TEXT OF RECORDED MATERIAL 65

APPENDIX C. FORMAT QUESTIONS 66

APPENDIX D. TEST QUESTIONS 69

REFERENCES 73

VITA 79

LIST OF TABLES

Table Page

1. Variable Characteristics for Review Questions Treatment 35

2. Variable Characteristics for Study Guide Treatment 36

3. Variable Characteristics for Limited Structure Treatment 36

4. Cell Means and Standard Deviations for Age by Treatment, Immediate and Delayed 39

5. Analysis of Covariance for Three Treatments and for the Variable Age 40

6. Cell Means and Standard Deviations for Sex by Treatment, Immediate and Delayed 41

7. Analysis of Covariance for Three Treatments and for the Variable Sex 42

8. Cell Means and Standard Deviations for Reading Medium by Treatment . . . .

9. Analysis of Covariance for Three Treatments and for the Variable Reading Medium 44

10. Analysis of Variance Means for All Effects, IQ by Three Treatments, Immediate and Delayed 45

11. Analysis of Variance for Three Treatments and for the Variable IQ 47

12. Scheffé Comparison of Group Means of Three Treatment Groups and IQ Level 48

LIST OF ILLUSTRATIONS

Figure | Page
1. Cell Membership of Treatment Groups for the Variables Age, Sex, Reading Medium, and IQ 22

2. Flow Chart for Treatment Programs 30

CHAPTER I

INTRODUCTION

Rationale

Listening has long been a major avenue of learning. In fact, prior to the advent of printed material, listening was the main method of obtaining information (Furness, 1956). Yet listening as a definite function and responsibility of the learner is often taken for granted. While listening is recognized as an important means of gathering information, specific questions related to its efficiency are still open to investigation. What type of, and how much, learner involvement is required for efficiency? Which parameters of efficient listening are especially open to the influence of training? How do various structuring practices or formats affect listening and auding efficiency?

Studies indicate that a major part of the average sighted child's school day is spent in listening activities. Wilt (1950) studied elementary grade students and estimated that more than half the child's day was spent in listening activities--more than in any other classroom activity. Further, studies examined by Henderson (1973) suggested that the sighted student's time spent

in listening averaged as much as two-thirds of his school day. Similar studies (Taylor, 1973) found 57.5 percent of elementary level students' school activities were centered around listening, while in high school and college, this ratio jumped to as much as 90 percent. Taylor stressed strongly that all this time is not necessarily spent in efficient listening.

Besides accounting for such a large percentage of time in the average child's school day, listening is actually the preferred means of learning for elementary level students since their listening comprehension is usually above their reading comprehension. At this age, listening is apparently a more natural process than the still-developing skills of reading, and so allows for better comprehension as well as retention (Taylor, 1973; Williams & Williams, 1972). It is further suggested by Taylor that this preference for listening continues until after the seventh grade unless the student's reading development is slow, in which case the preference continues even longer.

Though listening plays such an important role for the sighted child, this type of information-gathering is considerably more fundamental to the visually impaired student, and according to Barraga (1974) efficiency in this area is essential to his cognitive development. This is also true of a higher level of listening or "auding",

sometimes referred to as "aural reading" (Foulke, 1970), which includes interpretation and comprehension and is actually parallel to the visual act of reading (Caffrey, 1949).

For the visually handicapped student, whose visual channel provides limited and sometimes inaccurate information--and requires more time and effort to provide even this--listening and auding become primary sources for learning. Henderson (1973) stresses the increased role of listening for the visually handicapped student and states that for the severely visually impaired student, listening and auding may actually take the place of traditional reading. Foulke (1962, 1970) concurs and reports that when time is a factor aural reading is much more efficient than braille reading. In addition, a landmark study by Lowenfeld (1945) demonstrated that both the speed and comprehension of aural readers were superior to those of braille readers. In a later investigation by Steele (1969), the superiority of aural reading to braille was especially significant for students of lower intelligence and achievement levels.

As with the sighted child at the elementary level, the visually handicapped child seems to prefer listening throughout the grades (Morris & Nolan, 1969). However, due to the limited graphic material available and the additional time required for reading, reading

skills are often delayed for the visually handicapped student. Thus, listening and auding often remain the preferred method of learning (Henderson, 1973). As a result of this preference, a great deal of educational and leisure material has been made available through recordings and talking books and is employed in the schools.

Since it is recognized that listening does play such an important role in the visually handicapped child's learning, the question of inherent sensory compensation--or automatic superiority of other sensory channels--arises. Several studies have attempted to examine differences in auditory abilities between sighted children and visually handicapped children. Hartladge (1963) compared listening comprehension of both blind and sighted high school students and found no significant statistical differences between the two groups, when IQ, age, and sex were controlled; and in a study examining differences in auditory abilities between partially-sighted and sighted children, Hare, Hammil and Crandell (1970) found no difference in sound discrimination abilities. Crowley, Lake and Rathgaber (1965) examined several aspects of functional listening as compared between sighted and blind students at the elementary level and found that the sighted students actually performed better as measured by the Sequential Tests of Educational Progress (STEP):

Listening tests. While these studies do not agree as to individual findings, they have in common an eroding effect on the concept of automatic sensory compensation in the visually handicapped.

With listening and auding being a major part of the learning process, especially for the visually handicapped student, and since this student's listening abilities are not inherently superior, it becomes necessary to look at the efficiency of listening as a learning method. Petrie (1961) suggests that listening is actually not a very effective means of learning. Foulke (1969) offers these reasons why the aural reader faces more difficulties than the visual reader:

> . . . the uni-dimensional temporal display of information, the inability to control and vary reading rate, the inability to listen ahead or to listen back, the inability to alter the sequence in which information is taken from the aural display, and the unavailability of clues derived from the format of the printed page, which assist the reader in searching a book for desired information [p. 120].

Still another negative factor is the tendency of the listener to hear words rather than ideas (Burns, 1961). The effects of these difficulties are demonstrated in a report by Nichols (1948) where students remembered only 50 percent of recorded material on an immediate testing measure and only 25 percent of the information two weeks later.

The increased use of listening and aural reading

by visually handicapped students, as well as the difficulties inherent in the process, suggests a need for deliberate intervention to promote more efficient listening. Henderson (1973) suggests that not only must efficiency in listening be taught, but that it must receive a major emphasis in instruction. Foulke, too, after having called attention to the problems involved in the listening/auding process, stresses the need for a program of structure and guidance to decrease these negative effects. An important caution, though, is brought out by O'Connor (1959) when he cautions that efficient listening does not come from mere practice unless students are practicing positive listening habits.

How is it possible for teachers to promote more efficient listening? Providing a good listening climate is one way, and training programs for specific skills is another (Taylor, 1973). A third means suggested by Petty, Petty and Becking (1974) is providing specific purposes for listening activities. A fourth approach might involve recognition that active listening is usually more efficient than passive listening (Henderson, 1973; Burns, 1961).

In an article recommending needed research in this area, Blake and Amato (1967) suggest a fifth apaproach-- finding out which organizational methods will best facilitate increased skills. The present study will

assign itself to several of these approaches, specifically the role of active versus passive listening and the effects of various active organizational formats as guides for more efficient listening and auding.

Review of the Literature

This section presents a review of related literature dealing with studies undertaken in the area of listening efficiency, especially as it relates to the visually handicapped student. While the importance of listening as a learning tool for the visually handicapped student as well as the sighted student has been recognized for some time, research studies dealing with specific listening aids and programs have been surprisingly late in developing. Recently, however, a number of investigations have offered valuable information pertaining to the improvement of listening efficiency.

It is generally believed that active participation in the listening process promoted improved listening/auding efficiency. Burns (1961) states that this active participation must be both mental and emotional. Nolan (1966) suggests that even physical activities can be effective in promoting improved listening. In a study conducted with visually handicapped students, Nolan and Morris (1969) demonstrated that the active participation involved in notetaking and review led to superior auding

efficiency when compared to simple continous listening.

Yet, specific activities most conducive to improving listening and auding efficiency are still open to question. Some of the more commonly discussed choices include calling attention to the main ideas, use of supplementary materials, mental and written notetaking, repeated listening, varying the rate of presentation, and breaking lengthy material into shorter segments (Fawcett, 1963; Taylor, 1973; Nolan & Morris, 1969; Brothers, 1971; Foulke, 1968, 1970). When one surveys the added effectiveness of active participation in the listening process and then considers Foulke's (1970) warning that the lack of learned control inherent in listening and aural reading increases the likelihood that one will take a passive role, the need to seriously investigate efficacy of specific approaches becomes even more crucial.

The American Printing House for the Blind (APH) has promoted several research investigations into the functional listening efficiency of the visually handicapped student and continues to emphasize this area of research (APH, 1974). Two such studies were conducted separately by Nolan and Morris (1969) and by Brothers (1971). Both studies were primarily concerned with several specific parameters of active versus passive listening, as is this investigation.

In the aforementioned study supported by a

Public Health grant and assisted by APH, Nolan and Morris (1969) examined the effects of three variables on the listening comprehension of visually handicapped students. The three variables included type of material (math, science, literature, social studies), type of presentation formal (active versus passive), and rate of presentation (normal listening rate versus compressed speech). The subjects were students at residential schools for the blind ranging from fourth grade through high school. The three types of presentation formats included continuous listening with no additional guidance, listening interrupted for mental review, and listening interrupted for taking notes. Testing for comprehension was done immediately after the listening tasks. Results indicated that there was a significant interaction between rate of presentation and type of presentation format. While no significant difference was found between the two review methods, it was noticed that breaking the material into smaller segments (as was done in both review methods) promoted more efficient listening for the fourth through seventh grades. It was also found that normal listening rate was consistently superior to the compressed rate--a surprising result in comparison with several earlier studies. Barbara (1959) offers a possible clue to understanding this contradiction with his premise that, while the brain's ability to comprehend information faster than

the average speaking rate may present concentration problems, it is how one actively utilizes this time interval that is important.

In a second study promoted by APH, Brothers (1971) examined the effects of message length on both immediate and delayed recall. Subjects in this study were high school students at a residential school for the blind. The listening material was of the social studies informative type. Brothers presented the material on tape under four different message lengths: The entire Twenty-four minute selection, four segments of six minutes each, three eight-minute segments, and two twelve-minute segments. Multiple choice questions were administered immediately after the listening material, with appropriate questions being presented after each of the divided segments. The identical questions were re-administered approximately three days later. Results indicated that the various message lengths used in the study had no significant effect on either immediate or delayed recall. These two studies seem to leave the question of optimum message length unanswered. Interestingly, in the above study, braille readers performed better than print readers on the delayed recall measure.

Another study examining a possible relationship between preferred reading medium and listening efficiency was conducted by Nolan and Morris (1970). They also

found that the listening and auding skills of braille readers were superior to those of print readers, but only when the recorded material was judged to be difficult.

The efficacy of another type of presentation--that of allowing the learner to listen to material several times--was also investigated by the American Printing House for the Blind (1969). This study involved students in grades four through six and included both literary and technical types of recorded material. Results indicated that not only was repeated listening ineffective, but for some grades this approach actually diminished learning.

Also interested in examining parameters of more effective listening for the visually handicapped learner, the Kansas Division of Services for the Blind and Visually Handicapped in conjunction with a grant from the Department of Health, Education, and Welfare set up a three-year study program. The objective was to investigate methods for improving listening efficiency and to develop a curriculum based on these findings (Stocker, 1970). The investigators developed a training program of listening skills through which rehabilitation clients progressed. Priorities of the program included listening readiness skills, development of specific focusing skills, as well as those of recall and retention through the use of review. Although specific formats for presenting materials are

not described in the final report, methods employed to promote these latter skills of recall and retention included the use of informational material recorded in segments of approximately ten minutes each, with immediate as well as delayed testing measures. Results indicated that those clients participating in the training program performed significantly better after training as measured by the Brown-Carlsen Listening Test.

In addition to asking what techniques are most effective in improving listening and auding efficiency, there is also the question of when is the most appropriate time to employ these techniques. As to the temporal placement of listening guidance, the literature varies. In a recommended program to improve listening skills, Barker (1974) emphasized the need for both thinking about the topic in advance and using the inherent thinking-listening time lag to mentally review previous points. With regard to this variable, Richmond (1973) noted several studies which demonstrated the increased effectiveness of presenting study guide questions both prior to and following a reading task as compared to the absence of such questions. As to differences in effectiveness between study questions presented prior to listening/reading tasks as compared to review questions presented afterwards, the literature varies. Richmond, in his own investigation, examined this aspect of question placement

and found no significant superiority of one format over the other, although he did call attention to the interaction between effectiveness of question placement and type of questions. Thus, while it is often found that some questions are mobe effective than none, the superioirty of one temporal format over another has not been consistently established. It must be remembered that Richmond's study involved guidance for the visual reader rather than for the aural reader. Examination of these variables with the visually handicapped population has been very limited--a situation which has led the American Printing House for the Blind to suggest that such conditions as interrupting material for review and presenting guided direction prior to the material be investigated with visually handicapped learners (Daugherty, 1974).

In addition to presentation variables, learner variables often influence listening efficiency. Preferred reading medium as a variable has previously been reviewed (Brothers, 1971; Nolan & Morris, 1970). While it is generally accepted that the learner's level of intelligence influences listening and auding comprehension, actual statistical relationships have ranged from .38 to .79, with higher correlations existing for blind students as opposed to sighted students (Hartladge, 1963; Brothers, 1971). However, in a later study involving mentally retarded students, Hartladge (1965) found that while a

high correlation still existed between IQ and listening comprehension (.74 and .80), the higher correlation was for sighted students rather than for visually handicapped students.

When chronological and/or mental age is considered as a factor, the literature is somewhat incomplete, although some studies have explored age in the terms of grade level. Nolan (1969) investigated the variable of grade level as well as those of message length, type of material, reading medium, and rate of presentation. He found significant increases in listening ability between fourth and sixth grades but not afterwards.

The literature in general does not demonstrate an important relationship between the listener's sex and listening or auding ability (Bonner, 1960).

Research findings reflect both agreement and conflict regarding the efficacy of various approaches to promoting auding efficiency as well as the type of learner for whom these approaches are most appropriate. Since several studies on listening and aural reading agree that normal rate of speech, about 75 words per minute (Foulke, 1962), is superior when accompanied by active participation techniques, it appears pertinent to examine, at normal rate, some of the variables not yet agreed upon or heretofore not yet applied to a visually handicapped population.

Research findings so far have not agreed upon the most effective means of either focusing attention on main ideas or of review of important facts. Further, few studies have assigned themselves to the question of efficacy of the temporal placement of these various focusing techniques, as recommended by the American Printing House for the Blind. With the increase of recorded materials and the use of aural reading by visually handicapped students, the awareness of efficient methods of presentation becomes of paramount importance to the educator.

Statement of the Problem

The present study investigated the effects of three presentation formats of recorded material on the listening/auding efficiency of visually handicapped students. The three formats included providing only limited structure, interrupting recorded material for review questions, and preceding recorded material with study guide questions. Specifically, this study investigated the following questions:

1. Will performance means of three separate treatment groups differ significantly on the immediate testing measure? On the delayed testing measure?

2. Will there be a difference between the three treatment groups for the younger students? For the older students?
3. Will there be a difference between boys' and girls' test scores under the three treatments?
4. Will the test scores of braille readers differ from those of print readers under the three treatments?
5. Will performance means of the three treatment groups differ for three IQ ranges?

Definitions

The following definitions were established to allow for clarification and restricted generalizations.

Visually handicapped student.--The student whose vision is limited to the extent that it interferes with his process of getting information through the visual channel and requires special materials, or adaptations, for optimum learning. In this study, all students are legally blind but have varying degrees of residual vision.

Audiometric testing.--Pure-tone tests given throughout the speech range to insure adequate hearing of the participating subjects (University of Southern Mississippi Speech and Hearing Department).

Auding/aural reading.--Listening at a level involving comprehension and interpretation, and is parallel to visual reading; implies response of some type as well as attention (Caffrey, 1949; Taylor, 1973).

Listening/auding efficiency.--The extent to which the student is able to acquire, associate, and retain various kinds of information through the auditory channel.

Active listening.--Involves actual participation in the listening process; taking notes, mental review, focusing attention, outlining, or even a variety of more physical activities (Henderson, 1973; Stocker, 1971; Nolan & Morris, 1969).

Passive listening.--The absence of interaction with the listening material (Henderson, 1973; Stocker, 1971; Nolan & Morris, 1969).

Non-technical material.--Material which does not contain specific technical information (social studies or literature as opposed to science or mathematics).

Readability check.--Ascertaining that the material is at a particular comprehension level; for this study, computed by the Dale-Chall formula (University of Southern Mississippi Reading Clinic).

Structure and/or format.--The particular method of presenting auditory material to the student; in this study, the three treatments.

Reading medium.--Means by which the subjects read; braille or large print for students in this study.

Automatic sensory compensation.--The concept that limited ability in one sensory channel automatically leads to increased sensitivity in another sensory channel.

Limited Structure format.--The format which provides simple directions and knowledge of a test to follow, but no other intervention as structuring the listening experience.

Interrupted Review Questions format.--The format in which, in addition to simple directions and knowledge of a test to follow, the listening experience is accompanied by two sets of questions for mental review, one set placed halfway through the recorded material, and the other placed at the end.

Preceding Study Guide Questions format.--The format in which, in addition to simple directions and knowledge of a test to follow, students are provided with a set of questions prior to the listening experience; these are intended to focus the students' attention on important points to follow.

CHAPTER II

PROCEDURES

The goal of this study was to investigate the effects of three formats of presenting listening material to visually handicapped students. In addition, the effects as they relate to the variables of age, preferred reading medium, intelligence, and sex were explored. The purpose of this chapter is to outline and discuss the procedures and research design which were used to gather, analyze and interpret the data collected. This chapter is divided into five components: a) subjects, b) materials and instruments employed, c) procedures, d) data analysis, and e) limitations of the study.

Description of Subjects

Subjects for the study included students attending the Mississippi School for the Blind who were assigned to the fourth, fifth, sixth and seventh grades at the time of the study.

Pre-study descriptive data on each subject included audiometric testing and intelligence testing. Each student was administered individual audiometry tests for

hearing acuity utilizing the Beltone 9D portable audiometer. These examinations were given by advanced graduate students in audiology and were supervised by Dr. Robert Thomas of the University of Southern Mississippi Speech and Hearing Department. They were administered within two months of the actual investigation. Students not demonstrating normal hearing were excluded from the study. In addition, students meeting the criteria of normal hearing were administered the Slosson Intelligence Test by Dr. Sondra Kutzman of the USM Reading Clinic and the investigator. This was also done within two months of the study. The Slosson was chosen for its ease in administration and for its high correlation with the Stanford-Binet (.93; Slosson, 1963). The obtained IQ range for this final group of subjects was 68-143 with a mean of 93. These scores were employed as covariates as well as variables in the treatment of data.

The total number of students involved in the study after meeting the above criteria was thirty-three. This number included twenty-one boys and twelve girls, seventeen black and sixteen white students, seventeen braille and sixteen print students. Subjects ranged in age from ten to sixteen years.

The subjects were divided equally into three treatment groups for study. Groups were stratified for the criteria of sex, race, preferred reading medium

(braille or print), age (10-12 and 13-15), and IQ as obtained by the Slosson (106 and above, 95-105, 94 and below). Subjects were randomly assigned to the groups within the limitations placed by these criteria. Figure 1 displays a graphic representation of resultant cell distributions. Each analysis employed all thirty-three subjects; therefore an overlapping of cell membership existed.

Description of Materials and Instruments

The materials employed in this study consisted of four basic parts: 1) sample answer forms, 2) taped material on cassettes, 3) treatment or format materials, and 4) set of questions used for both immediate and delayed testing.

Sample Answer Form

The sample answer forms (see Appendix A) were employed to familiarize the subjects with the format of directions and questions that would be used for the actual test and to give students an opportunity to become familiar with the method of recording their responses. These sample answer forms consisted of directions identical to those on the test and several simple multiple choice questions related to such topics as the date and location of the school. As with the actual test, the entire sample form was offered in both braille and large type, as well as recorded on tape.

Figure 1

Cell Membership of Treatment Groups
for the Variables Sex, Reading
Medium, Age, and IQ

Sex	Lim. Struc.	Rev. Ques.	Study Guide
Boys	8	7	6
Girls	3	4	5

Medium	Lim. Struc.	Rev. Ques.	Study Guide
Braille	7	4	6
Print	4	7	5

Age	Lim. Struc.	Rev. Ques.	Study Guide
10-12	7	8	5
13-15	4	3	6

IQ	Lim. Struc.	Rev. Ques.	Study Guide
higher 106+	1	3	3
average 95-105	6	4	4
lower 94-	4	4	4

Recorded Listening Material

Taped material for the listening exercise in this study consisted of an informational prose selection adapted from The World of Mankind; Man the Toolmaker, a social studies textbook published by Follett (see Appendix B). This particular passage was chosen for the following reasons: 1) it was of the informational prose type, which is similar to much material currently employing recorded presentations; 2) its duration was a reasonably close approximation of content divisions for this type of material; 3) the material was new to all students in the study as ascertained through teacher consultation and examination of textbooks employed throughout the grades; and 4) the material met the readability requirement of being at the upper fourth grade level. To test for this last criteria, the selection was subjected to the Dale-Chall readability to insure that it was of the desired level. The upper fourth grade level was decided as appropriate since: a) the reading levels of the subjects, as measured by the Stanford Achievement Test, ranged from upper second grade to early sixth grade; b) research indicates that the listening comprehension of students in this grade range is superior to their reading comprehension (Taylor, 1973); and c) this particular level was approved for appropriateness by specialists in the University of Southern Mississippi Reading Clinic. The selection was recorded at

approximately 175 words per minute since this is generally agreed as normal listening rate, and since normal rate has been found to be as effective or more effective than accelerated rates for this type of exercise (Brothers, 1971; Crowley, 1965; Nolan & Morris, 1969).

Treatment of Format Materials

Materials for Treatment RQ (Interrupted Review Questions) consisted of two sets of five questions (see Appendix C). They were chosen from the actual test questions and were inserted after each of two four-minute segments of the taped listening material previously described. Each set of questions was randomly selected from those test questions which were directly related to the taped material presented immediately beforehand. These review questions were administered orally on tape so as to insure uniformity of presentation.

For Treatment SC (Preceding Study Guide Qeustions), the same set of questions used as review guides in Treatment was employed. These ten questions were again presented orally on tape so as to insure uniformity, but for this group they were presented together in one set and were inserted prior to the presentation of the taped selection for listening.

Treatment LS (Limited Structure) employed a general introduction, directions, and motivation component that was uniformly used for all treatment groups; otherwise

no additional materials were required as no added specific guidance was programmed for this group.

Test Questions

The fourth segment of materials used in the study consisted of the test questions prepared in each student's preferred reading medium (see Appendix D). These were developed by the examiner after Thorndike and Hagen (1961). Questions were of the multiple choice type with three choices for each question and were identical for each of the three treatment groups. Multiple choice questions were chosen for their relative efficiency in responding and scoring (Brothers, 1971). The questions included vocabulary, recall of facts, and interpretation and were twenty in number. Questions were subjected to the same readability check as was the taped material and to the scrutiny of members of the USM Reading Clinic. The same questions were used for both immediate and delayed testing. Questions were presented orally on tape as well as in both braille and large type. Multiple choice answers were set up in such a way as to require only a simple marking technique on the part of the subject, thus allowing for consistent responses.

Description of Procedures

Subjects were divided into three treatment groups as earlier described. Immediate testing for comprehension

and retention was accomplished during the first week of May, 1975, while the delayed testing measure was undertaken one week later. Testing was done in a private room on the campus of the Mississippi School for the Blind. The investigator and principal's assistant accompanied students to the testing area.

Interrupted Review Questions--Treatment RQ

The following procedure was used for the group receiving the Review Question treatment.

Step 1: A brief introduction and explanation of the study was given to the students along with general comments of encouragement to do their best.

Step 2: Students were then told to listen carefully to the following taped material and that they would be asked questions afterwards to see how much they remembered. In addition, students were told that halfway through the taped material, and again at the end, they would be asked review questions specifically about the segment they had just heard. They were to try to answer these review questions silently to themselves.

Step 3: The previously described recorded material was administered with the five review questions appearing at the halfway mark and an additional five questions at the end of the selection.

Step 4: The previously described set of test

questions was administered immediately following the recorded selection. Questions were offered in each student's preferred reading medium.

Step 5: One week later, this same set of questions was administered in the same testing area This was done as a measure of delayed retention.

Preceding Study Guide Questions--Treatment SG

The following procedure was used for the group receiving the Study Guide treatment.

Step 1: A brief introduction and explanation of the study was given to the students along with general comments of encouragement to do their best.

Step 2: Students were then told to listen carefully to the following taped material and that they would be asked questions afterwards to see how much they remembered. In addition, students were given the same set of questions used in the Review Questions treatment, but for this group, all ten questions were presented together and prior to the actual selection of recorded social studies material. Students were told to use these questions as guides to help focus their attention on special points of interest throughout the material.

Step 3: Following the administration of the study guide questions, the identical recorded selection used for the other treatment groups was played for the students.

Step 4: The previously described set of test questions was administered immediately following the recorded selection. Questions were offered in each student's preferred reading medium.

Step 5: One week later, this same group of students was administered the same set of questions in the same testing area. This was done as a measure of delayed retention.

Limited Structure--Treatment LS

The following procedure was used for the group receiving the Limited Structure treatment.

Step 1: A brief introduction and explanation of the study was given to the students along with general comments of encouragement to do their best.

Step 2: Students were then told to listen carefully to the following recorded material and that they would be asked questions afterwards to see how much they remembered.

Step 3: The previously described recorded material was administered with no interruptions or additional guidance.

Step 4: The previously described set of test questions was administered immediately following the recorded selection. Questions were offered in each student's preferred reading medium.

Step 5: One week later, this same group of

students was administered the same set of questions in the same testing area. This was done as a measure of delayed retention.

Administration of all treatments was accomplished by the investigator. See Figure 2 for a graphic representation of the temporal procedure used for each of the three treatment groups. Both trials of test questions--immediate and delayed--were subjected to the described data analysis.

Statistical Treatment of Data

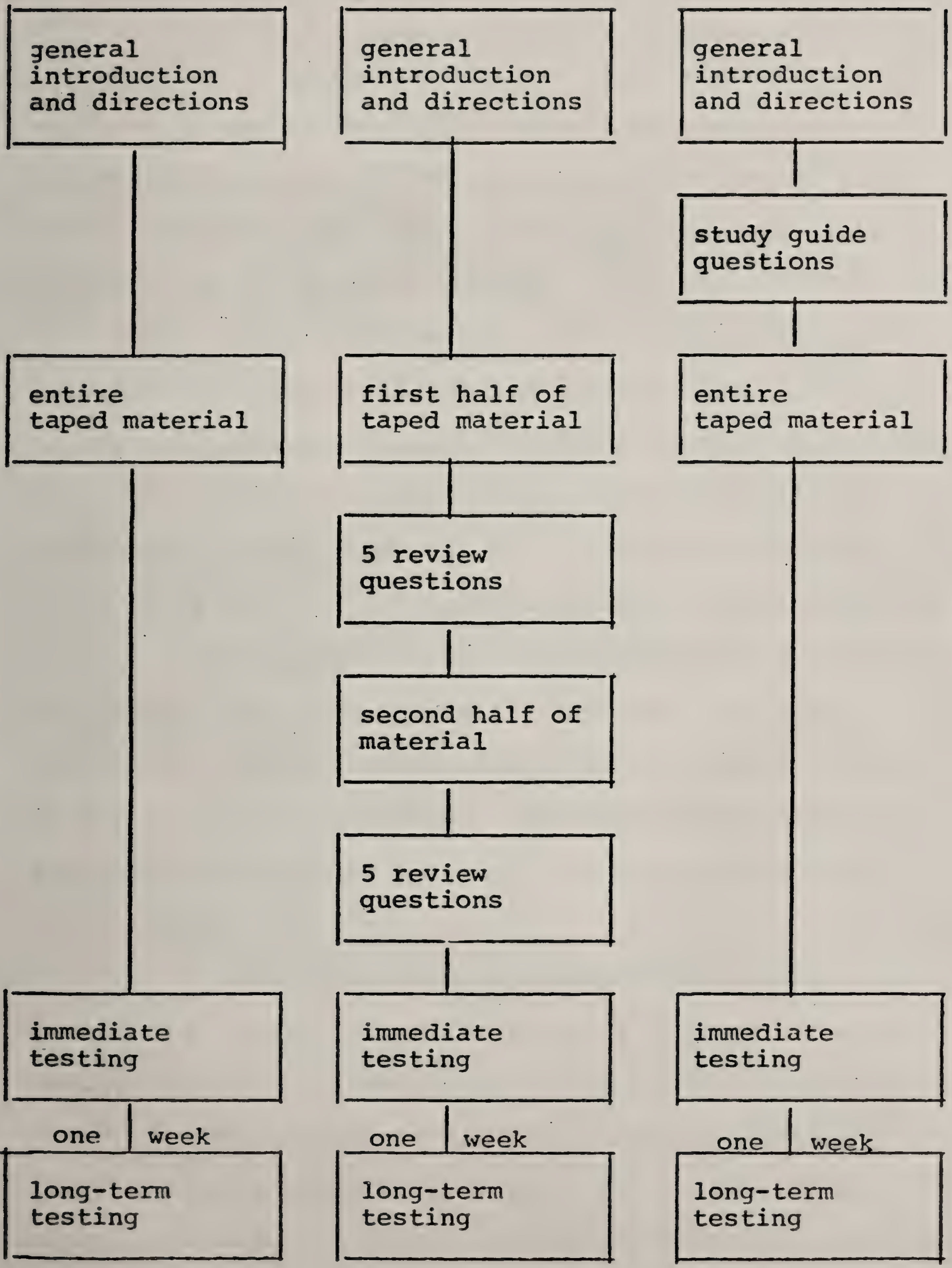
The experimental subjects were randomly assigned to one of three formats of presenting recorded listening material--Limited Structure (LS), Interrupted Review Questions (RQ), and Preceding Study Guide Questions (SG). To assist in answering the research questions of the study, several specific data gathering and statistical techniques were used.

A 2X3 analysis of covariance was used to investigate the first research question: whether or not performance means of three separate treatment groups would differ. The analysis was conducted for both immediate and delayed test measures.

A 2X3 analysis of covariance was also used to investigate the second research question: whether the performance mean of the older subjects would differ from

Figure 2

Flow Chart for Treatment Programs



that of the younger subjects on the immediate test measure. This analysis was again repeated for the delayed test measure.

The technique of analysis of covariance was again employed to answer the third research question: whether the performance mean of boys differed from that of girls on the immediate test measure; the technique was again repeated for the delayed measure.

A last pair of analyses of covariance was conducted to investigate the fourth research question: whether or not the performance mean of braille readers would differ from that of print readers. Again, these analyses were conducted for both immediate and delayed test measures.

In each of the above cases, IQ as obtained by the Slosson Intelligence Test was the covariate, and immediate and delayed test scores were the dependent variables. Because cell sizes were not equal, least-squares analyses of covariance were performed. Possible statistical differences among treatments as well as interaction were investigated.

In addition, a two-way analysis of variance was conducted to examine differences among IQ ranges for immediate and delayed testing under the three presentation formats. This procedure was directed toward answering the fifth and final research question. Due to unequal cell sizes, an unweighted means analysis was utilized.

For all analyses, an alpha level of .05 was set forth.

Limitations of the Study

In analyzing the data for study, the generalizations, conclusions, and implications were within the limitations imposed by these factors:

1. The study was restricted to the sample of thirty-three students attending the Mississippi School for the Blind.
2. The study did not consider individual students' previous experience in listening.
3. The type of material used in this investigation was confined to the prose informative type and of social studies content.
4. The study did not investigate the role or influence of motivation or encouragement, though this was kept uniform for all three treatment groups.

CHAPTER III

RESULTS

Data were collected to compare three formats of presenting recorded listening material to visually handicapped students. This was done to determine if the treatments effected differences in listening comprehension and retention.

The three treatments analyzed in this study included Limited Structure (LS), Interrupted Review Questions (RQ), and Preceding Study Guide Questions (SG). Limited Structure consisted of instructing the students to listen carefully to the recorded selection and to answer questions afterwards to see how much they remembered. Review Questions involved the additional presentation of five review questions (from the test to follow) halfway through the passage, and another five questions at the end of the material. These review questions were to be answered mentally. Study Guide consisted of presenting the same ten questions as in Review Questions; however, their temporal placement differed in that all ten questions were presented prior to listening to the recorded passage so as to focus attention on important points. All

treatment groups were then given the same twenty-item test in their own reading mediums. These questions were administered immediately after the recorded material and again one week later.

The findings presented in this chapter were dervived from analyses of the data obtained from both immediate and delayed testing as it related to the following questions:

1. Will the performance means of the three treatment groups differ significantly on the immediate testing measure? On the delayed testing measure?
2. Will there be a difference between the three treatment groups for the older students? For the younger students?
3. Will there be a difference between boys' and girls' test scores under the three treatments?
4. Will the test scores of braille readers differ from those of print readers under the three treatments?
5. Will the performance means of the three treatment groups differ for the three IQ ranges?

For descriptive purposes, Table 1 indicates variable characteristics for members of each treatment group. In observing these characteristics, it can be noted that:

1. Immediate and delayed test scores for Review Questions and Study Guide Questions are similar and are accompanied by similar IQ means; exceptions exist however with regard to subjects #2, 18, and 31.
2. While immediate and delayed test scores for Limited Structure are somewhat lower than for the other two groups, this group is also characterized by lower IQ means.
3. The two exceptionally low scores considerably lower group means and could render these means unrepresentative of the groups as wholes.

TABLE 1

Variable Characteristics for Review Questions Treatment

Subject	Sex	Age	Reading Medium	IQ	Imm. Score	Del. Score
1	M	10-3	Print	103	17	16
2	M	11-6	Braille	74	18	16
3	F	10-1	Braille	124	20	20
9	F	11-8	Print	91	16	13
12	M	10-7	Print	80	13	12
18	M	10-8	Braille	91	8	5
20	M	13-0	Print	109	18	18
21	F	13-0	Braille	95	17	18
25	M	12-2	Braille	111	19	17
27	F	12-2	Print	109	19	18
31	M	15-7	Print	74	18	18
$\bar{X}$	M	11-11		91.71	15.86	14.57
	F	11-9		104.75	18.00	17.25
	T	11-10		96.45	16.64	15.54

TABLE 2

Variable Characteristics for Study Guide Treatment

Subject	Sex	Age	Reading Medium	IQ	Imm. Score	Del. Score
4	M	10-3	Print	111	19	17
5	F	12-0	Braille	143	19	19
7	F	10-4	Print	74	15	17
13	F	12-4	Print	84	13	10
16	M	11-9	Print	99	19	18
17	M	13-1	Braille	74	13	12
22	F	14-4	Braille	96	18	16
23	M	13-4	Braille	84	17	16
28	M	15-7	Braille	90	19	17
29	F	13-1	Braille	99	19	17
32	M	12-4	Print	116	18	17
$\bar{X}$	M	12-9		95.66	17.50	16.17
	F	12.0		99.20	16.80	15.80
	T	12-5		97.27	17.18	16.00

TABLE 3

Variable Characteristics for Limited Structure Treatment

Subject	Sex	Age	Reading Medium	IQ	Imm. Score	Del. Score
6	M	10-8	Print	101	19	18
8	M	11-9	Braille	107	18	17
10	M	11-7	Braille	68	6	5
11	M	14-0	Braille	72	10	17
14	M	11-7	Print	100	19	17
15	M	12-1	Print	79	16	16
19	F	11-5	Braille	85	14	14
24	M	13-1	Braille	78	10	14
26	F	13-3	Braille	97	19	17
30	F	13-7	Braille	97	14	15
33	M	13-2	Print	89	14	16
$\bar{X}$	M	12-3		86.75	14.00	15.12
	F	12-9		93.00	15.67	15.33
	T	12-5		88.45	14.45	15.18

For statistical findings to be considered reliable, statements regarding assumptions inherent in the analysis of covariance are appropriate. Assumptions, within the confines of this study, are:

1. There is a linear relationship between the covariate and the dependent variables.
2. Cell membership is randomly assigned.
3. Treatment effects are additive.

With regard to the first assumption, the linear relationship between the covariate (IQ) and dependent variable (immediate and delayed test scores) has been validated by the existence of regression coefficients significant at the .01 level for all analyses. The second assumption was validated through the use of a random stratification technique as described by Sax (1968), which employed age level, sex, race, preferred reading medium, and IQ as the criteria. For the third assumption, treatments Review Questions and Study Guide Questions were designed in such a way as to differ in specific characteristics from the traditional presentation format previously offered the subjects. Treatment Limited Structure was not so designed for comparative purposes. In each treatment, the subject matter was entirely new and, therefore, presumed additive for each group.

The first two analyses were two-way analyses of covariance (age by treatment, with IQ as the covariate). These analyses were run separately for immediate

and delayed test scores. Table 4 presents cell means and standard deivations for this analysis, while Table 5 presents the source table.

An inspection of Table 4 reveals that while the cell means for Review Questions and Study Guide treatments were slightly higher than those for Limited Structure for both age groups, the IQs for these same cells were also proportionately higher in most instances. Table 5 reflects no significant main effects differences among treatments or between the older and younger age ranges, nor were there any interaction effects. From these tables it can be concluded that no one treatment was significantly better for the younger or older students, on either the immediate or delayed testing measure, and that older students did not consistently perform superiorly to younger students.

The next two analyses of covariance were performed for the variable sex, again with IQ as the covariate (see Figure 1 for limits). Once more, these analyses were run separately for immediate and delayed test scores. Table 6 presents cell means and standard deviations for this analysis, while Table 7 presents the source table.

As indicated in Table 6, there was not a large difference between cell means on treatment test scores, when sex was the variable. While it may be noted that

TABLE 4

Cell Means and Standard Deviations for Age by Treatment Immediate and Delayed

		Limited Structure		Review Questions		Study Guide		
		IQ	Test Score	IQ	Test Score	IQ	Test Score	
IMMEDIATE	10-12 Years	91.00	15.14	96.87	16.25	102.20	17.00	X̄
		14.04	4.56	16.33	3.99	26.83	2.83	SD
		7		8		5		N
	13-15 Years	84.00	13.25	92.67	17.67	93.17	17.33	X̄
		11.16	4.27	17.62	.58	14.32	2.25	SD
		4		3		6		N
DELAYED	10-12 Years	91.00	14.71	96.87	14.62	102.20	16.20	X̄
		14.04	4.07	16.33	4.66	26.83	3.56	SD
		7		8		5		N
	13-15 Years	84.00	16.00	92.67	18.00	93.17	15.83	X̄
		11.16	1.41	17.62	.00	14.32	1.94	SD
		4		3		6		N

TABLE 5

Summary of Analysis of Covariance
Treatment by Age

		IMMEDIATE			DELAYED		
Source	df	Mean Square Adj.	F	P	Mean Square Adj.	F	P
Treatment (T)	2	6.79	.79	NS	.72	.08	NS*
Age (A)	1	4.18	.49	NS	30.33	3.44	NS
T X A	2	6.22	.73	NS	6.21	.70	NS
Within	26	8.54			8.80		

* NS = not significant at the .05 alpha level

TABLE 6

Cell Means and Standard Deviations for Sex by Treatment Immediate and Delayed

		Limited Structure		Review Questions		Study Guide		
		IQ	Test Score	IQ	Test Score	IQ	Test Score	
IMMEDIATE	Boys	86.75	14.00	91.71	15.86	95.67	17.50	$\bar{X}$
		14.64	4.87	16.14	3.98	16.11	2.34	SD
		8		7		6		N
	Girls	93.00	15.67	102.75	18.00	99.20	16.80	$\bar{X}$
		6.93	2.89	14.75	1.83	26.43	2.69	SD
		3		4		5		N
DELAYED	Boys	86.75	15.12	91.71	14.57	95.67	16.17	$\bar{X}$
		14.64	3.88	16.14	4.69	16.11	2.14	SD
		8		7		6		N
	Girls	93.00	15.33	102.75	17.25	99.20	15.80	$\bar{X}$
		6.93	1.53	14.75	2.99	26.43	3.42	SD
		3		4		5		N

TABLE 7

Summary of Analysis of Covariance
Treatment by Sex

	IMMEDIATE				DELAYED		
Source	df	Mean Square Adj.	F	P	Mean Square Adj.	F	P
Treatment (T)	2	7.80	.88	NS	.39	.04	NS*
Sex (S)	1	.15	.02	NS	.22	.02	NS
T X S	2	3.42	.38	NS	4.01	.39	NS
Within	26	8.90			10.15		

* NS = not significant at the .05 alpha level

the test scores for girls were slightly higher than those for boys for all treatments, this difference was not significant and was accompanied by a slightly higher IQ range for the girls as well. This was the case for both immediate and delayed testing measures.

Table 7 reflects no significant main effects differences among treatments or between boys and girls, nor were significant interaction effects noted. Therefore, according to this study's results, there was no difference between girls' and boys' performance under any of the three treatments for either immediate or delayed testing measures.

The next two analyses of covariance were performed for the variable preferred reading medium, again with IQ as the covariate. Once more, these analyses were run separately for immediate and delayed testing scores. Table 8 presents cell means for this analysis, while Table 9 displays its source table.

As is evident from Table 8, there is no great numerical difference between cell means or treatment test scores for either braille or print readers. In addition, most of the slight variations among cell means are accompanied by relative IQ variations. Table 9 indicates no significant main effects differences among treatments or between types of readers, nor were there any interaction effects. Thus it can be concluded that no one

TABLE 8

Cell Means and Standard Deviations for Reading Medium by Treatment

		Limited Structure		Review Questions		Study Guide		
		IQ	Test Score	IQ	Test Score	IQ	Test Score	
IMMEDIATE	**Braille**	86.29	13.00	96.00	15.75	97.67	17.50	$\bar{X}$
		14.53	4.65	20.77	5.31	23.94	2.34	SD
		7		4		6		N
	Print	92.25	17.00	95.57	17.14	96.80	16.80	$\bar{X}$
		10.37	2.45	14.33	2.12	17.74	2.68	SD
		4		7		5		N
DELAYED	**Braille**	86.29	14.29	96.00	14.75	97.67	16.17	$\bar{X}$
		14.53	3.90	20.77	6.70	23.94	2.32	SD
		7		4		6		N
	Print	92.25	16.75	95.57	16.00	96.80	15.80	$\bar{X}$
		10.37	.96	14.33	2.52	17.74	3.27	SD
		4		7		5		N

TABLE 9

Summary of Analysis of Covariance
Treatment hy Referred Reading Medium

		IMMEDIATE			DELAYED		
Source	df	Mean Square Adj.	F	P	Mean Square Adj.	F	P
Treatment (T)	2	6.59	84	NS	1.03	.10	NS*
Reading Medium (R)	1	13.98	1.77	NS	6.83	.69	NS
T X R	2	10.00	1.27	NS	3.31	.33	
Within	26	7.88			9.95		

*NS = not significant at the .05 alpha level

format of presenting listening material was significantly superior for either braille or print readers, on either immediate or delayed testing measures.

In addition to the analyses of covariance, a two-way analysis of variance was performed to determine the relationship of IQ on the effects of the three treatments. Table 10 displays the cell means and standard deviations for this analysis while Table 11 presents its source table.

From Table 10 it can be seen that for both immediate and delayed testing measures, both the higher and lower IQ levels (see Figure 1 for limits) performed best under Review Questions, while the average IQ group performed best under Study Guide. However, these differences were small, and Table 11 shows that no one treatment was significantly better for the group as a whole, or for any particular IQ level. Table 10 also indicates that, as would be expected, IQ does have an effect on test performance in that the higher the IQ, the higher the test score. However, this relationship was shown here for the immediate test measure only. Scheffé's Test for Multiple Comparisons (Edwards, 1969) was run to determine where the differences lay. Results of these comparisons are presented in Table 12. The difference was shown to exist between IQ levels 106 and above and 94 and below.

In addition to the foregoing analyses, a Pearson product moment correlation was computed to examine the

TABLE 10

Means for All Effects
IQ by Three Treatments

	IMMEDIATE			
Source	Limited Structure	Review Questions	Study Guide	Main Effects for IQ
Higher IQ	18.00	19.00	18.67	18.55
Average IQ	16.50	15.25	18.75	16.83
Lower IQ	10.50	16.25	14.50	13.75
Main Effects for Treatments	15.00	16.83	17.30	

	DELAYED			
Source	Limited Structure	Review Questions	Study Guide	Main Effects on IQ
Higher IQ	17.00	18.33	17.67	17.67
Average IQ	16.17	14.25	17.00	15.81
Lower IQ	13.25	14.75	13.75	13.92
Main Effects for Treatments	15.47	15.78	16.14	

TABLE 11

Analysis of Variance for Three Treatments and for the Variable IQ

		IMMEDIATE			DELAYED		
Source	df	Mean Square	F	P	Mean Square	F	P
Treatment (T)	2	12.99	1.62	NS	.99	.09	NS*
Intelligence (IQ)	2	51.91	6.47	S*	30.79	2.76	NS
T X IQ	4	11.15	1.39	NS	3.91	.35	NS
Within	24	8.02			11.13		

* NS = not significant at the .05 alpha level

S = significant at the .05 alpha level

TABLE 12

Means of Three IQ Levels

Comparison	Differences	F (Scheffe)	F'
Higher versus Average	1.72	1.24	6.80
Higher versus Lower	4.80	9.14	6.80*
Average versus Lower	3.08	5.52	6.80

* significant at the .05 alpha level

relationship of immediate test scores to those obtained on delayed testing. This computation yielded an r of .82 indicating that, in most instances, delayed test scores were directly related to immediate test scores. In this case, high scores remained relatively high while lower scores remained low.

Summary

Descriptive data regarding the subjects and the various statistical treatments of the study were discussed, with means and standard deviations based on these statistical treatments computed.

Six 2X3 analyses of covariance were run to test for effects of treatments on differences in age, preferred reading medium, and sex. These analyses were run separately so as to examine both immediate and delayed test performances. In each case, IQ was employed as a covariate. Results of these analyses indicated that none of the three treatments significantly affected the subjects' performance on either immediate or delayed test measures, for the variables of age level, preferred reading medium, or sex.

In addition, a two-way analysis of variance was run to test for effects of IQ level on performance under the three treatments. This analysis indicated that, as expected, students with higher IQs performed better on

the immediate test measure, but that no one treatment was superior for any of the three IQ levels involved. Scheffé's Test for Multiple Comparisons indicated that, for this variable, the difference lay between the IQ range of 106 and above, and IQ range of 94 and below.

Finally, a Pearson product moment correlation coefficient was computed to examine the relationship between performance on immediate and delayed test measures. This examination yielded an r of .82 indicating that for most students, performance on the immediate test measure was indicative of performance on the delayed test measure.

CHAPTER IV

DISCUSSION

The purpose of this chapter is to briefly summarize the study and discuss the results which were presented in Chapter III as they relate to the research questions investigated. Each research question is followed by a brief description of the statistical treatment employed and a discussion of the results as they relate to this study and to previous literature. Also, recommendations for further research are presented.

Summary of the Study

Statement of the Problem

The study was designed to investigate the effects of three different formats of presenting recorded material for listening to visually handicapped students. These three treatments consisted of providing limited guidance, interrupting the material for guided review, and providing guidance in focusing attention previous to presentation of the material. Possible effects of these treatments were examined with regard to the variables of age range, preferred reading medium, sex, and IQ level.

Specifically, the study sought to answer these

questions:

1. Will the performance means of the three treatment groups differ significantly on the immediate test measure? On the delayed test measure? If so, how?
2. Will there be a difference between the three treatment groups for the younger students? For the older students?
3. Will there be a difference between boys' and girls' performance means under the three treatments?
4. Will the performance means of braille readers differ from those of print readers under the three treatments?
5. Will the performance means of the three treatment groups differ for the three IQ levels?

In order to accomplish this, data were treated statistically by the use of analyses of covariance, analysis of variance, and Pearson product moment correlation.

Procedures

Thirty-three students attending the fourth through seventh grades at the Mississippi School for the Blind were divided into three groups according to random stratification. Each group was then presented with social

studies material recorded at normal rate. Method of presentation differed for each group and included the Limited Structure format, the Interrupted Review Questions format, and the Preceding Study Guide Questions format. The test measure, as developed by the investigator, was administered both immediately after the listening exercise and again one week later.

Discussion of the Results

The first research question asked whether or not important differences would exist among mean scores for treatments RQ, SG, and LS. To analyze data related to this question, a 2X3 analysis of covariance was done using IQ as the covariate. No significant difference was found among any of the three treatment groups on either the immediate or delayed test measures. When one examines the characteristics of the specific treatments, the data strongly suggests that providing structured guidance either in the form of review questions after the material or in the form of attention-focusing questions beforehand was not superior to simply providing the knowledge of a test to follow with no additional guidance; nor was there a difference between Review Questions and Study Guide Questions.

These results seem to both support and contradict other research findings. Nolan and Morris (1969) also

examined various active and passive methods of presenting recorded material (including social studies type at normal rate) to visually handicapped students. They found no difference between two review methods (mental and written review) but that some active involvement was superior to none. In the present study, the two treatments in including more active involvement were also equally effective, but so was the Limited Structure treatment. This was true on both immediate and delayed testing measures. It can be argued, however, that the Limited Structure treatment--intended to be relatively passive--could actually have been considered somewhat active in that students' attention may have been significantly sharpened by the knowledge of a test to follow.

In addition, the equal effectiveness of Review Questions afterwards and Study Guide Questions beforehand concurs with some of the findings of Richmond's (1973) study. In an investigation examining effects of question placement in facilitating reading exercises, he found no difference between providing these questions before or after the material. As with the present study, the same questions were administered in both cases. It is important to note here that Richmond's study involved guidance for the visual reader while the present study is concerned with the aural reader. However, the general literature agrees that providing some means of guidance is effective

for both types of readers.

Though unmeasured and unrecorded other than by observation, Review Questions appeared to stimulate more enthusiasm and involvement in the listening exercise than did the other treatments. This was evidenced by excited utterances, raising of hands, exchanging of smiles and "knowing" looks while the review questions were being administered. While all three treatment groups were given uniform remarks of encouragement, no specific design for providing motivation was included in the experiment. While one study reported earlier did employ a specific motivator, no statistical data documented the researchers' assumption that the motivator improved discriminatory powers of the treatments. It may be that, in the present study, the treatment RQ was in itself more motivating to the students, although performance was not affected. Certainly the area of motivation as a variable deserves further consideration in research design.

The second research question posed a concern regarding possible performance differences between the two age levels. To analyze data related to this question a 2X3 analysis of covariance, with IQ as covariate, was conducted. Results indicated that no one treatment was superior to another for either the younger or older groups of students (see Figure for limits). Also, it was not found that the older students performed consistently better

than the younger students, even with IQ considered. These results are not supportive of earlier findings that listening skills improve from fourth to seventh grades (Nolan, 1969). However, it should be remembered that Nolan's previously mentioned study used grade placement as the variable, while the present study used membership in age groups as the variable. While age and grade level could be assumed to be somewhat directly related, there is much variance as to this relationship. No other studies which examined actual age as a variable on a similar population are known to the investigator.

The third research question was concerned with whether there would be differences between boys' and girls' mean scores for any of the three treatments. To examine data related to this question a 2X3 analysis of covariance was conducted, using IQ as a covariate. As expected, no difference was found for any of the three treatments on either immediate or delayed testing measures when sex was a variable. While sex has not been considered a likely determinant of listening efficiency, studies which have accounted for this variable have not found significant differences (Bonner, 1960).

A further question was concerned with whether braille readers or print readers were superior under any of the three treatments, or put another way, whether any one treatment was superior to the others for braille or

print readers. Statistically, braille and print readers performed equally well under all three treatments, when the effects of the covariate IQ were considered; no one treatment proved superior for either braille or print readers.

This does not support earlier studies (Nolan & Morris, 1970; Brothers, 1971) which both indicated that braille readers performed better than print readers under such treatments as review techniques and varied message lengths. These results are qualified, however, in that in the first case, the superiority existed only when the recorded material was judged to be difficult (a variable not tested in the present study); and in the second case, the superiority was found only on the delayed recall measure.

A further research question concerned itself with the relationship of IQ to performance under the three treatments, as before, on both immediate and delayed test measures. More specifically it asked whether the performance means of treatments RQ, SG, and LS would differ for three IQ ranges. Since IQ had been employed as a covariate on previous analyses, a separate analysis of variance had to be conducted to examine the data. Results indicated that IQ was indeed related to performance means but only for the immediate test measure. Scheffé's Test was performed and demonstrated that the comparison of IQ range

106 and above to IQ range 94 and below was significantly different. Analysis also indicated that no one treatment was superior to another for any of the three IQ ranges.

It is difficult to relate these results to the general literature for two primary reasons: 1) correlations varying as much as from .38 to .80 have been computed on blind and sighted students (Hartladge, 1963), and 2) there also exists a discrepancy as to criteria for IQ levels or ranges, thus correlations become difficult to compare. A further problem is the uncontrolled effect of chance for sharing ideas and answers among the students during the time between the immediate and delayed test measures. Further, when the means for different treatments were plotted for the three IQ levels, strong interaction was indicated; yet this was not significant statistically, raising the question of how many directions or tendencies were undetected due possibly to the small number of participants in the study.

In addition to the foregoing concerns, a further question relating to a possible, and expected, relationship between immediate and delayed test measures was investigated. A Pearson product moment correlation yielded a coefficient of .82 indicating that, in most cases, delayed test scores were directly related to immediate test scores. While it was to be expected that those students obtaining high scores on the immediate test measure,

would likely obtain similar scores on the delayed measure, a further question is still left open according to the present study: if IQ were related to immediate test scores, and immediate test scores were related to delayed test scores, then what is the relationship of IQ to these delayed test scores?

In summary, it appears that the three presentation formats investigated in this study were all equally effective for the variables of age range, preferred reading medium, and sex, when the influence of intelligence was controlled. It was further concluded that this influence of intelligence must be controlled in related research since its relations to performance was statistically significant. Also, while it was orginally felt by the investigator that Review Questions and Study Guide Questions were more "active" than Limited Structure, it appears, within the confines of this study, that the simple knowledge of a test following the listening materials was sufficient to effect performance similar to the more structured treatments.

As a result of this study, the following recommendations are made regarding further research in this area:

1. The level of listening efficiency of subjects be examined prior to investigation of specific variables.

2. The influence of IQ on treatment effects and accompanying variables continue to be accounted for in the experimental design, and that this influence be more carefully examined.
3. The influence of motivational and encouragement components be accounted for within the experimental design.
4. Greater number of subjects be included, especially when a cell design further limits the number being investigated at any one time.
5. Treatments such as those included in the present study be investigated with respect to additional types of educational material, including material of a technical nature.
6. Subjects attending day programs as well as residential programs be included to examine possible differences with regard to program placement.

APPENDIX A: SAMPLE ANSWER FORM

Sample Answer Form*

Read each question carefully while it is read for you on the tape. For each question, choose the right answer, and make a mark on the letter by that answer.

1. What day is today?

    a. Saturday
    b. Thursday
    c. Friday

2. What city is this?

    a. Jackson
    b. Chicago
    c. Paris

3. What time of the day is it now?

    a. morning
    b. afternoon
    c. night

---

* The Sample Answer Form was actually presented to students in either large type or braille, depending on their preference.

APPENDIX B: TEXT OF RECORDED MATERIAL

Text of the listening material used in this investigation is not reproduced here due to its previous copyright.

The text of the material, recorded on cassette for purposes of this study, can be obtained through the investigator.

APPENDIX C: FORMAT MATERIALS

Review Questions Treatment

Questions following first half of taped material:

1. Where do the Lapps live?
2. What animals help the Lapps to herd their reindeer?
3. Why do the Lapps have to work very hard in early winter?
4. What is a pack reindeer?
5. In the story, it says "hunters use a low open sleigh". For what is this used?

Questions following the second half of the taped material:

6. What do the Lapps often wear when they hunt?
7. What do the Lapps make from reindeer meat and blood?
8. What do the Lapps drink?
9. Why do the Lapps like to live in tents?
10. How are the Lapps like cowboys?

Study Guide Treatment

Questions were the same as those presented to Review Questions; however in this case all ten questions were presented together prior to the listening exercise.

APPENDIX D: TEST QUESTIONS

Read each question carefully while it is read for you on the tape. For each question, choose the right answer, and make a mark on the letter by that answer.

1. Where do the Lapps live?

   a. in the arctic north
   b. in Canada
   c. near the South Pole

2. Why are the Lapps called nomads?

   a. they have large farms
   b. they are very strong
   c. they travel with their herds

3. How long do most adult Lapps stay with their group?

   a. one year
   b. all their lives
   c. just during the summer

4. What is a council?

   a. men who are good at hunting
   b. men who are in charge of the Lapp families
   c. men who discuss social issues

5. What animals help the Lapps to herd their reindeer?

   a. deer
   b. dogs
   c. cows

6. How do the Lapps separate their reindeer from the rest of the herd?

   a. they mark their ears with a sign
   b. they can remember what they look like
   c. they clip their antlers in a special way

7. Why do the Lapps have to work very hard during early winter?

   a. there will not be much daylight to work by later

b. the children go to school then and so they can't help much
c. they can make more money if they work hard during this time

8. What is a pack reindeer?

a. reindeer that lead the group
b. reindeer that pull the sleighs
c. reindeer that need more training

9. In the story, it says "hunters use a low open sleigh". For what is this used?

a. to carry valuable belongings
b. to bring home a catch
c. to carry all their hunting gear

10. What are the sleighs made of?

a. metal
b. wood
c. heavy plastic

11. What do the Lapps often wear when they hunt?

a. skis
b. skates
c. snowshoes

12. Where do the Lapps like to build their camps?

a. next to cities so they can get supplies
b. next to water
c. next to caves for protection

13. Why don't the Lapps own very many things?

a. they would have to carry everything with them
b. they are poor
c. there aren't many stores

14. What do the Lapps use to make their shoes?

a. wood
b. reindeer skin
c. carved from antlers

15. What do the Lapps use to line their shoes in the winter?

    a. hay
    b. cotton cloth
    c. rubber

16. What do the Lapps make from reindeer meat and blood?

    a. pudding
    b. sausage
    c. porridge

17. What do the Lapps drink?

    a. coffee
    b. juice from dried leaves
    c. reindeer milk

18. Why do the Lapps like to live in tents?

    a. tents are easy to move around
    b. tents are fun
    c. tents are warmer than houses

19. How are the Lapps like cowboys?

    a. they have rodeos
    b. they round up their herds of animals
    c. they wear the same type of clothing

20. What are some Lapps starting to do now?

    a. settle down to hunt and fish
    b. build large buildings
    c. have elections instead of councils

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